From: Nancy Judd <NancyJ@windwardenv.com>
Date: Monday, December 16, 2013 2:46 PM
To: "Niemi, Cheryl (ECY)" <cnie461@ECY.WA.GOV>
Subject: Follow up to our conversation at the 11/25 Delegate's Table meeting

Hi Cheryl,
Sorry I am a little slow, but I did want to follow up with you from our conversation at the last Delegate's Table meeting.

We talked some about consideration of shellfish lipid content in calculation of HH WQC. The assumed lipid content in BCFs used for HH WQC calculations is 3%.

The Florida Department of Environmental Quality (FL DEQ) has a nice write up on this issue and notes that EPA guidance encourages use of local or regional data on lipid content (see section 2.4.4 of their TSD http://www.dep.state.fl.us/water/wqssp/docs/tr_review/hh_tsd_032813.pdf).
This was also covered in their presentation to the Policy Forum.

For lipiphilic chemicals like PCBs, this assumption makes a big difference. If you assume a lipid content of 1.5%, your HHWQC become 2X higher for lipiphilic chemicals. The table in section 2.4.4 provides a good summary of lipid content of different shellfish and finfish. Shellfish are generally below 1.5% lipid.

This issue was also presented in comments from the Boeing Company on Ecology's Fish Consumption Rate Technical Support Document (see section C. Fish Species of attached document) in the context of WA FCRs. Please note that while Windward did contribute to some portions that were included in Boeing's comments on the FCR TSD, I am not representing Boeing at the Delegate's Table.

Lon Kissinger from Region 10 EPA has done a lot of work breaking out

the shellfish fraction of diet in some of the tribal studies, and tribal rates seem to be the focus of the rates Ecology is considering. This information is summarized in his Tribal Framework document (http://yosemite.epa.gov/R10/CLEANUP.NSF/7780249be8f2515388256 50f0070bd8b/e12918970debc8e488256da6005c428e/$FILE/Tribal%20Shellfish%20Framework.pdf,
Tables B-1 and B-2 in Appendix B).

The Tulalip Tribes' consumption of shellfish is reported as 42.2% and consumption of salmon is reported as 49.7%. The Suquamish Tribe consumption of shellfish is reported as 23.9% and consumption of salmon is reported as 65%.The majority of shellfish consumption for both groups are clams and crabs, this is broken out further in another document from Lon (EPA 2005).

The lipid contents for clams and crabs reported in FL's TSD are 1.2% or less.

Bruce Hope raised the issue that Chinook salmon have high lipid content (over 10%) and that might "balance out" the lower lipid content in the shellfish. That is not true of other Pacific salmon which are below 6% lipid (see table at the bottom of this webpage: http://seafoodhealthfacts.org/seafood_choices/salmon.php). This lower lipid content also helps explain why PCB body burdens are generally lower in other species of salmon.

I also raised the issue that Chinook are not likely the majority or most commonly consumed type of salmon from the Puget Sound area. Again please see Boeing comments on the FCR TSD (see Tables 1-3 of the attachment on Windward letterhead at the end of the comments).

The data we were able to pull for recreational catch for the Port Angeles area 2001-2003 (Strait of Juan de Fuca, Dungeness River, Elwha River, and Morse Creek) indicated 6% of the catch was Chinook. Note we were not able to readily obtain recreational catch data for

other areas (there was not an intentional focus on that area).

For Puget Sound and Strait of Juan de Fuca commercial catch from 2000-2011, only 3% was Chinook. The Suquamish Tribe survey reported 17% of salmon consumption was Chinook. The good news for consumers is that most of the salmon people are eating are species that spend more of their time in the ocean (i.e. they are less impacted by Puget Sound exposures) and have lower lipid content (so less accumulation of lipiphilic chemicals like PCBs).

If we are focusing on tribal exposures, then it is worth considering tribal body weights. These are also included in Lon's reviews above and are 81 and 79 kg for those two tribal groups.

Most Americans are heavier than 70 kg. In the FL DEQ TSD, they report the average American adult body weight as 79.96 kg based on NHANES data. The result of using a more accurate average body weight is HH WQC that are still protective but are 10-15% higher.

I am busy this week but happy to talk to you more about these issues if we can find a time. After Thursday, I am out through January 6th.

Best, Nancy

EPA. 2005. Application of the draft framework for selecting and using tribal fish and shellfish consumption rates for risk-based decision making at CERCLA and RCRA cleanup sites in Puget Sound and the Strait of Georgia to the Lower Duwamish Waterway sediment cleanup action - June 16, 2005. US Environmental Protection Agency, Region 10, Seattle, WA.

Nancy Judd
Senior Risk Assessor

200 W Mercer St, Suite 401
Seattle, WA 98119
206.812.5419
206.217.0089 (fax)
nancyj@windwardenv.com